Item 28: Bull Trout and Westslope Cutthroat Trout Populations

Evaluation Objectives: Monitor changes in bull trout and westslope cutthroat populations in key habitats on the forest.

Methods: Fish population monitoring is generally conducted by Montana Fish, Wildlife, and Parks (MT FWP). Population estimates are determined using standard methods such as depletion, mark-recapture, and redd counts. Since 1980, MT FWP has been monitoring bull trout populations in the Flathead Basin using redd counts. Adult bull trout reside in Flathead Lake, Swan Lake, and Hungry Horse Reservoir. In the fall, these fish spawn in tributary streams and their redd numbers are a useful way to monitor their populations. Westslope cutthroat trout populations are generally monitored through electro-fishing surveys in several index streams across the forest.

Evaluation: Figure 1 summarizes bull trout redd count data across the forest by sub-basin. This data set includes index streams only (where redds are counted every year). It is clear that the Swan sub-basin contains the highest number of redds on the forest, and appears to have peaked in 1998, probably due to restrictive fishing regulations in Swan Lake and its tributaries in 1993. Lower numbers are found in the North and Middle forks of the Flathead River system. Index counts have been conducted on four North Fork and four Middle Fork tributaries annually since 1980. In the mid to late 1980s, the establishment of Mysis shrimp changed the species composition and food web dynamics in Flathead Lake, and allowed lake trout numbers to increase rapidly. As a result, bull trout numbers began declining in the North and Middle forks of the Flathead due to competition/predation with Lake trout (Figure 1).

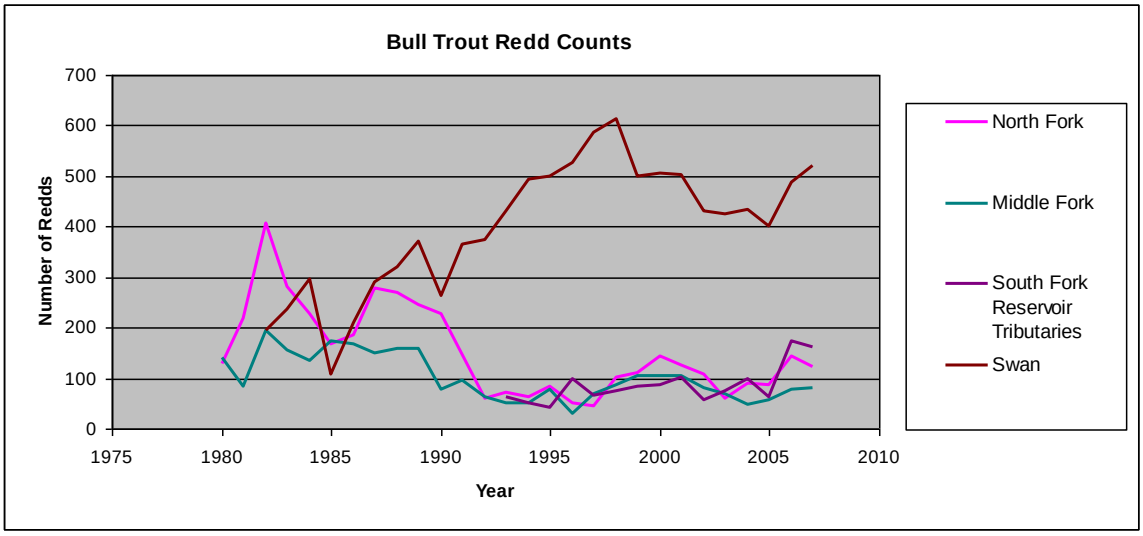

Figure 1. Total Bull Trout Redd Counts on the Flathead National Forest (index streams only).

During this monitoring period, a significant threat to bull trout has developed in the Swan sub-basin. In the early 2000s, it became apparent that lake trout had become established in the lake and their numbers were increasing. In 2007, a large scale gill netting project was initiated using a commercial fishing operation to get a population estimate. This was conducted using the mark-

recapture method, but results were not conclusive. Estimates ranged between a few thousand fish to tens of thousands of fish. Population estimates are currently underway using catch data. If lake trout become well established in Swan Lake, bull trout numbers are expected to decrease (Donald and Alger 1993).

The current Forest Plan provides direction to maintain viable populations of native species. In the Flathead basin, lake trout compete directly with bull trout, and this is now the case in the Swan Lake system. Lake trout became well established in Flathead Lake in the late 1980s, following the establishment of Mysis shrimp. Bull trout numbers began to decline soon after lake trout became established. This decline is evident in the redd counts in the North and Middle Forks (Figure 1). The Forest Service has no jurisdiction over management of fish populations. However, the Forest Service plays an active role in working with MFWP on the management of populations that directly affect native fish, such as bull trout. In the Swan Lake system, an interagency work group has been formed to address the recent established lake trout.

Westslope cutthroat trout are generally abundant on forest lands within the three forks of the Flathead river system, but has declined in the Stillwater and Swan sub-basins. The decline of westslope cutthroat trout can largely be attributed to the same factors that have impacted bull trout. The westslope cutthroat trout has been especially affected by the introduction of brook and rainbow trout, which are non-native species. Brook trout appear to competitively exclude the cutthroat, while rainbow trout hybridize with cutthroat, resulting in a loss of genetically pure populations (USDA 2003). One recent study suggests that the rate of genetic introgression between cutthroat trout and rainbow trout populations in the North Fork Flathead River drainage is increasing (Hitt et al. 2003). In 2003, a status review was conducted for westslope cutthroat trout across its range, and the Flathead River Basin is considered a stronghold for westslope cutthroat (Shepard et al. 2003). The South Fork Flathead River drainage in particular is a stronghold with numerous populations of genetically pure fish (USDA 2003).

In the Swan and Stillwater sub-basins, there are a few remnant populations of westslope cutthroat in headwater streams, but they are at risk due to their isolation and continual threat from non-native species. MT FWP conducts population estimates of cutthroat trout through electro-fishing and gill netting on an annual basis. The results of these surveys are not reported here, but they are available through MT FWP. The population estimates tend to fluctuate year to year with varying degrees of confidence in the estimates.

In 2006, the status of cutthroat populations was characterized for each sub-watershed (6^{th} code HUC) across the forest during forest plan revision. All sub-watersheds in the three forks of the Flathead were characterized as having "strong" populations of cutthroat. Sub-watersheds in the Swan and Stillwater basins were generally characterized as "depressed" due to invasion of non-native fish. These calls were based on viability assessment for westslope cutthroat (USDA 2006) and local knowledge of forest fisheries biologists.

Work is continually underway to protect isolated cutthroat populations. Sanko Creek on the Tally Lake Ranger District contains a robust population of pure cutthroat, and work is currently underway to install fish barriers to prevent possible invasion of brook trout that are presently downstream. In addition, the Flathead National Forest in cooperation with MT FWP, is currently

implementing a large project in the South Fork Flathead over the next 10 years to remove hybridized trout from 22 headwater lakes which threaten genetic integrity of the westslope cutthroat trout within the South Fork Flathead River sub-basin.

Recommended Action: The primary role of the Forest Service is to manage fish habitat. MT FWP has jurisdiction over fish populations, and these populations are monitored regularly by that agency. It is recommended that this monitoring item continue to be reported, with primary dependence on MT FWP data and cooperation.